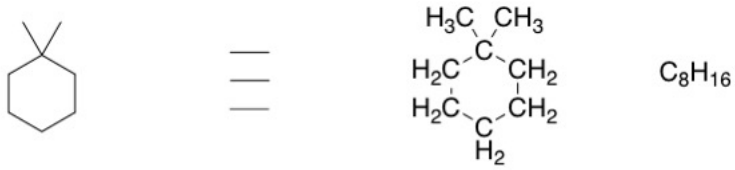
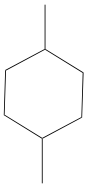
ISOMERS

Structural (Constitutional) Isomers

Share the same molecular formula but have the atomic bonds in different places



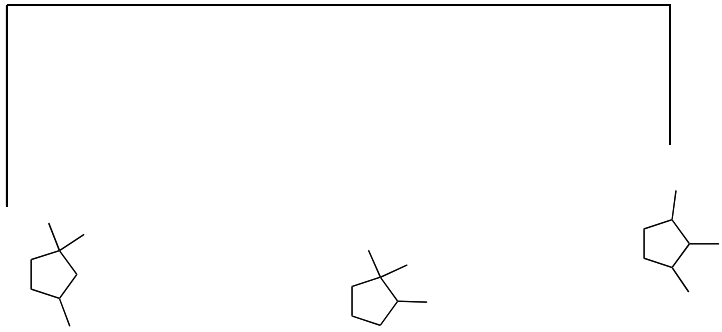
1,1-dimethylcyclohexane



1,4-dimethylcyclohexane

The above two compounds are structural (also known as constitutional) isomers

Structural or constitutional isomers



1,1,3-trimethylcyclopentane 1,1,2-trimethylcyclopentane 1,2,3-trimethylcyclopentae

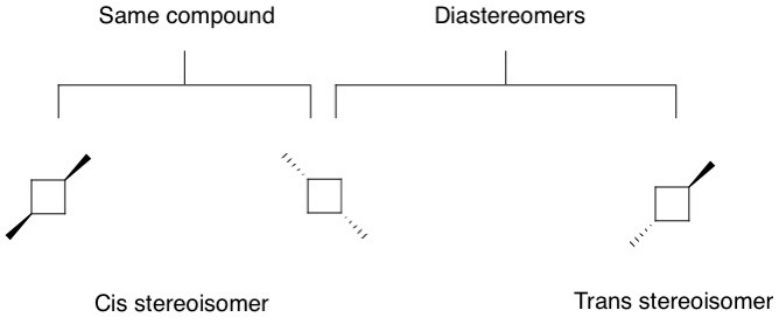
Stereoisomers

Compounds with the same molecular formula, same order of connection (base name) but connection of atoms that differ in 3D geometry

Two Types:

1. Diastereomers - stereoisomers that are not mirror images
2. Enantiomers - stereoisomers that are non-superposable mirror images of each other

Example: 1,3 dimethylcyclobutane

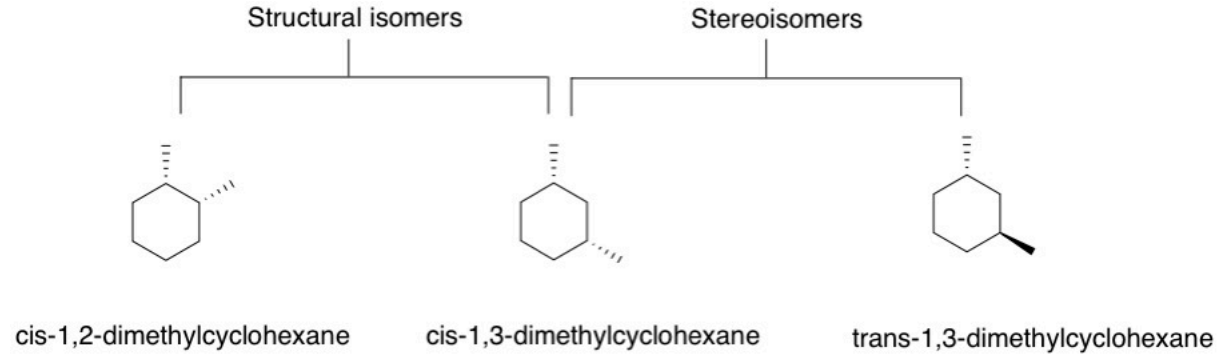


The first and second compounds are the same compound rotated in 3D space. The third compound has different geometry at one center, making it a stereoisomer, specifically a diastereomer.

Cis - the substituents are on the same side of the ring

Trans - the substituents are on opposite sides of the ring

Example: 1,2-dimethylcyclohexane and 1,3-dimethylcyclohexane



The second two compounds are diastereomers of each other.